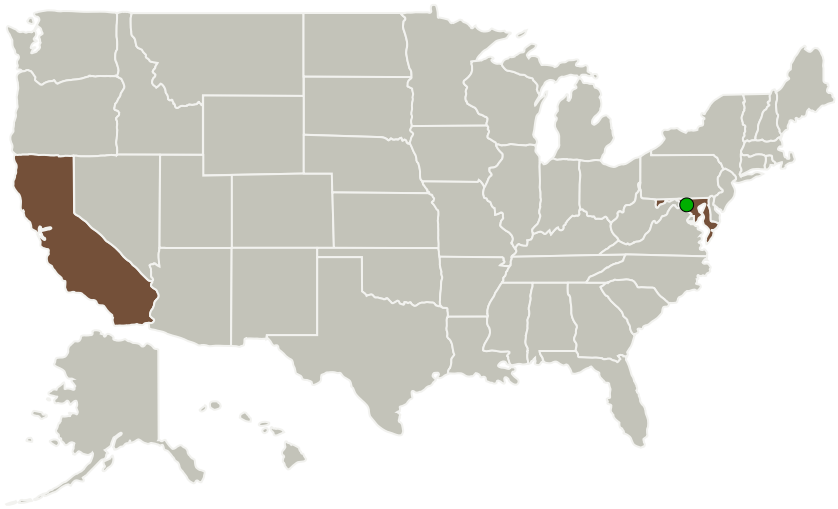
Anticipating the Geoeffectiveness of Coronal Mass Ejections, Phase I

Completed Technology Project (2012 - 2012)

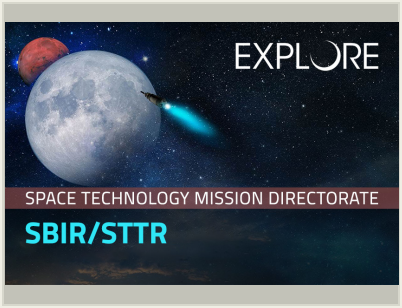
Project Introduction

Coronal Mass Ejections (CMEs) are responsible for some of the most severe space weather at Earth. Major geomagnetic storms arise when CMEs carry large amounts of magnetic flux as they propagate in the solar wind. If these magnetic fields have a southward orientation (oppositely directed to the magnetic field at the Earth's magnetopause), they can cause a geomagnetic storm. Predicting in advance whether observed CMEs will carry geoeffective magnetic fields is a long-term priority for the CCMC at NASA GFSC and other groups within NASA as well. We propose to combine the existing CORHEL (Corona-Heliosphere) model of the solar corona and solar wind with a robust technique for generating simulated CMEs. When successfully completed, the new tool, CORHEL-CG, will allow routine simulation of CMEs and represent a leap forward in physics-based space weather prediction models.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Predictive Science, Inc.	Lead Organization	Industry	San Diego, California
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



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Primary U.S. Work Locations	
California	Maryland

Project Transitions

February 2012: Project Start

August 2012: Closed out

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Predictive Science, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

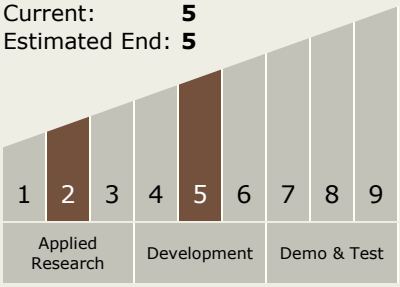
Carlos Torrez

Principal Investigator:

Jonathan Linker

Technology Maturity (TRL)

Start: **2**
Current: **5**
Estimated End: **5**



Anticipating the Geoeffectiveness of Coronal Mass Ejections, Phase I

Completed Technology Project (2012 - 2012)

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.5 Radiation
    - TX06.5.4 Space Weather Prediction

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System